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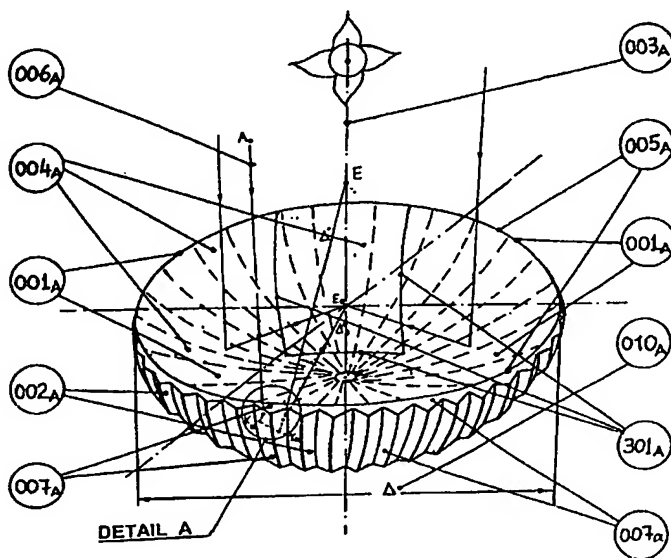
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(54) Title: HYBRID PHOTOVOLTAIC CONCENTRATING SYSTEM WITH CORRECTED TOTAL REFLECTION REFLECTORS



(57) Abstract: This invention refers to the development of innovative parabolic and paraboloid total reflection Reflectors with Curved Rectangular Total Reflection Prisms, which raise the imperfection of diffusion at the conventional rectangular prisms of the conventional parabolic and paraboloid TRR so that an accurate focusing and high Concentration (500 till 1500 suns or even more) are succeeded. Also refers to the development of an Innovative Solar Wave Guide with total reflection walls (Solar Artery), with Curved Rectangular Total Reflection Prisms which raise the phenomenon of diffusion (and losses) at the conventional Rectangular prisms of the conventional Hollow Solar Wave Guides and increase, one or even more orders of magnitude, the range of Solar Arteries for the same level of losses.

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## INTERNATIONAL SEARCH REPORT

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 A. CLASSIFICATION OF SUBJECT MATTER  
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According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

 Minimum documentation searched (classification system followed by classification symbols)  
 IPC 7 F24J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, COMPENDEX

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 02/084747 A (PAPADOPOULOS ALEXANDROS) 24 October 2002 (2002-10-24) page 9 - page 10; figure 3	1
A	US 4 154 219 A (O'NEILL MARK J ET AL) 15 May 1979 (1979-05-15) abstract; figures	1
A	US 5 056 892 A (COBB JR SANFORD) 15 October 1991 (1991-10-15) abstract; figures	1
A	US 4 444 468 A (MORI KEI) 24 April 1984 (1984-04-24) abstract; figures	1
A	US 4 720 170 A (LEARN JR MARTIN P) 19 January 1988 (1988-01-19) abstract; figures	1

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Information on patent family members

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Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 02084747	A	24-10-2002	GR	1003860 B1	08-04-2002
			EP	1388176 A1	11-02-2004
			WO	02084747 A1	24-10-2002
			US	2004163697 A1	26-08-2004
US 4154219	A	15-05-1979	NONE		
US 5056892	A	15-10-1991	US	4906070 A	06-03-1990
			AR	245987 A1	30-03-1994
			AU	582283 B2	16-03-1989
			AU	6457686 A	28-05-1987
			BR	8605708 A	18-08-1987
			CA	1279783 C	05-02-1991
			DE	3688123 D1	29-04-1993
			DE	3688123 T2	26-08-1993
			DK	559686 A	22-05-1987
			EP	0225123 A2	10-06-1987
			ES	2003516 A6	01-11-1988
			HK	47595 A	07-04-1995
			IL	80692 A	10-06-1990
			JP	10082902 A	31-03-1998
			JP	10068804 A	10-03-1998
			JP	2670518 B2	29-10-1997
			JP	62144102 A	27-06-1987
			JP	3262230 B2	04-03-2002
			JP	2000137105 A	16-05-2000
			JP	2001311808 A	09-11-2001
			JP	2003227910 A	15-08-2003
			KR	9503434 B1	12-04-1995
			MX	168138 B	06-05-1993
			NO	864631 A , B,	22-05-1987
			NO	932336 A	22-05-1988
			US	4805984 A	21-02-1989
			AT	101924 T	15-03-1994
			AU	582481 B2	23-03-1989
			AU	6457786 A	16-07-1987
			BR	8605709 A	18-08-1987
			CA	1268969 A1	15-05-1990
			DE	3689668 D1	31-03-1994
			DE	3689668 T2	29-09-1994
			EP	0235447 A2	09-09-1987
			ES	2049209 T3	16-04-1994
			HK	47395 A	07-04-1995
			JP	2628858 B2	09-07-1997
			JP	62165603 A	22-07-1987
			KR	9503436 B1	12-04-1995
			MX	170423 B	23-08-1993
US 4444468	A	24-04-1984	JP	3032045 B	09-05-1991
			JP	57037321 A	01-03-1982
			DE	3176497 D1	03-12-1987
			EP	0046546 A1	03-03-1982
			HK	21090 A	23-03-1990
US 4720170	A	19-01-1988	NONE		